

Claims

1. A needleless syringe for injecting an active principle (7) initially placed between, on the one hand, an injector ~~(1, 10)~~ comprising at least one injection nozzle, said injector being placed at the downstream end (2) of the syringe, and, on the other hand, a wall (8) that can be displaced under the effect of a propulsive system (9) pressurizing and expelling the active principle through the injector, characterized in that the injector (1, 10) consists of the assembly of at least two elements (3, 4, 5, 6, 33, 34); each element having a downstream face, an upstream face and a lateral surface joining them together, ⁴⁰ the ⁴⁰ contacting surfaces (30, 40, 40', 50, 60, 330, 340) of said elements in the assembly being wholly or partly lateral surfaces of said elements; at least one of the contacting surfaces having at least one groove (31, 41, 41', 53, 54, 55) which constitutes an injection nozzle in the assembly of said elements.
2. The needleless syringe as claimed in claim 1, characterized in that the contacting surfaces (30, 40, 40') are surfaces of revolution.

3. The needleless syringe as claimed in claim 1, characterized in that the contacting surfaces (50, 60) are flat surfaces.

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4. The needleless syringe as claimed in one of claims 1, 2 and 3, characterized in that the groove (31, 41, 41') is straight.
5. The needleless syringe as claimed in one of claims 1 and 2, characterized in that the groove is helical.
6. The needleless syringe as claimed in one of claims 1, 2 and 3, characterized in that a groove (54) is formed by the convergence of at least two grooves beginning from the upstream face and ending in a single groove towards the downstream face of the element (34).
7. The syringe as claimed in one of claims 4, 5 and 6, characterized in that the groove (31, 41, 41') has a constant cross section.

8. The syringe as claimed in one of claims 4, 5 and 6, characterized in that the groove (53, 54, 55) has an evolving cross section.

5 9. The needleless syringe as claimed in one of claims 1, 2, 3 and 8, characterized in that the injector (1) includes a support (4) comprising a housing into which a one-piece core (3, 33, 34) is fitted.

10 10. The needleless syringe as claimed in one of claims 1, 3 and 8, characterized in that the injector comprises at least one core consisting of at least two quarters assembled via their flat faces to form at least one core with a nozzle of evolving cross section, the quarters of the various cores being fitted into housings of a support.

11. The needleless syringe as claimed in one of claims 1, 2, 3 and 8, characterized in that the injector (10) comprises at least one core consisting of at least two quarters (5, 6) assembled by their flat faces (50, 60) to form at least one core with a nozzle (55) with an evolving cross section, the quarters (5, 6) of the various cores being held together by overmolding (45).

12. An injector (1, 10) for a needleless syringe, characterized in that said injector consists of at least two elements (3, 4, 5, 6, 30, 33, 34); each element having a downstream face parallel to the downstream face of the injector, an upstream face and a lateral surface joining them together, the contacting surfaces (30, 40, 40', 50, 60, 330, 340) of said elements in the assembly being wholly or partly lateral surfaces of said elements; at least one of the contacting surfaces comprising at least one groove (31, 41, 41', 53, 54, 55) which constitutes an injection nozzle in the assembly of said elements.